GARDEN AND FOREST.

PUBLISHED WEEKLY BY

THE GARDEN AND FOREST PUBLISHING CO.

OFFICE: TRIBUNE BUILDING, NEW YORK.

Conducted by . . . . . Professor C. S. SARGENT.

ENTERED AS SECOND-CLASS MATTER AT THE POST OFFICE AT NEW YORK, N. Y.

NEW YORK, WEDNESDAY, SEPTEMBER 13, 1893.

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The Proper Work of Experiment Stations.

A FORTNIGHT ago we made allusion to the honors which the agricultural societies of many lands had just paid to Sir John Bennet Lawes for his work of half a century at Rothamsted Farm. The distinguishing characteristic of these experiments has been the persistence with which the original purpose has been adhered to. Sir John set out primarily to investigate some of the fundamental problems relating to the nutrition of plants and animals, and he realized at the outset that the work of a single year would count for very little. Every season has peculiarities of its own, so that the practical reply which the plant and soil make to the inquiry of the investigator will vary with the different conditions of frost and sunshine, of rain and drought. A given test must be repeated year after year, and applied under the same conditions so far as possible before the cumulative results of the work give an unmistakable reply to the inquirer. Of course, no repetition of an experiment can be of any value unless the entire series has been started in the right direction. This implies that Sir John began cautiously, and after a wide survey of the field and a clear comprehension of what would be the outcome of a century's experiments in a given direction. With these truths in mind he has never been in a hurry to announce results with positiveness. Fully realizing the value of time in these trials, his one work has been to hold on with steadiness and with perfect accuracy of detail, both in practice and in making records. It has long been a current story that to a student who once made some inquiry as to the probable amount of nitrogen taken from the soil by a given crop, Sir John replied that he could not answer that question, inasmuch as he had only been experimenting on that point for twenty-one years.

Now, our own stations are all comparatively new. None of them seems to have laid out a plan for prosecuting any inquiry for a long series of years. Perhaps the men who direct them are not all capable of devising broad plans, or they have so little confidence in the stability of the future management of their institutions, that they cannot count on any continuous work in a given line. Many things can be done for the immediate benefit of agriculture and horticulture without waiting long, but in reading over some of the bulletins from our stations issued a few years ago one cannot help but feel that many of them were crude and undigested, to say the least, and at times they have been misleading in their interpretation of the tests they have made. Some of the more recent ones, too, show a waste of energy, especially in their devotion to matters which hardly come within their province. The excuse for the existence of such stations is that in agriculture and horticulture new and improved practice is essential that these great industries may keep abreast of the progress which is made in every other branch of human activity. There is no reason why the Government should help any one in a matter wherein he can help himself, but the things to be learned before methods of cultivating the soil can be materially improved are often of such a nature that they require experiments by trained observers who are skilled in scientific methods. This is beyond the power of the ordinary farmer or fruit-grower. Many of the tests require time, which he cannot afford to spare; many of them require expensive apparatus, which he cannot afford to purchase, and which he could not use if he had them; many of them demand an outlay of money beyond his means.

These are the justifying reasons for Government assistance of this character. It is in reality furnishing an education which it would be impossible to obtain otherwise. Much of the work, however, like the testing of different varieties of fruits and vegetables which the stations now undertake, might well be left to individual cultivators. Several of the stations, for example, this year have grown from fifty to one hundred different varieties of Strawberries, and kept careful records of their treatment, of the time of fruiting, of the quality and abundance of fruit, and then these records have been published and disseminated at a considerable expense. It would be unjust to say that all this work is worthless. It is true, however, that if any of the new varieties of Strawberries have proved exceptionally good or bad at any station, that is no proof that the variety would not have shown opposite results on land half a mile distant from the experiment grounds, and the trials give little proof of what the same plant may do another year anywhere. Those who grow strawberries for market, and those who grow them simply for home use, and are interested in such matters, will gladly undertake work of this sort, and the truth about a new variety of any fruit will soon be ascertained on the trial-grounds of nurserymen and others. This will be published in horticultural papers and at horticultural meetings, and the originators of really meritorious varieties will be prompt to advertise their excellence in every way, so that really any new variety will find its true place within a reasonable period without any assistance from the stations. Indeed, it may be questioned whether any good fruit or vegetable has acquired established popularity through their aid.

Of course, stations may do valuable work in this direction, but organizations of trained workers can serve a much higher purpose by devoting themselves to the more serious scientific facts upon which cultural practice rests. Such work has not only a greater intrinsic value, but it is work which the ordinary farmer or fruit-grower or gardener cannot do for himself. Sir John Bennet Lawes would hardly have deserved so much gratitude or achieved such renown if he had devoted half a century to testing tomatoes or strawberries.

MR. GEORGE NICHOLSON, Curator of the Royal Gardens at Kew, who came to this country to represent Great Britain among the judges of the Horticultural Department of the Columbian Exposition, sailed for home a fortnight ago, after remaining two months in this country. On the eve of leaving our shores he gave a reporter an account of

some of his impressions of America, which were published on Sunday last in the New York *Tribune* and in the papers of several other cities. Mr. Nicholson's ample knowledge, his catholic taste and sound judgment give a genuine value to any of his deliberate utterances on horticultural matters, and we are, therefore, glad that his views have been so widely published. We desire especially now, however, to call attention to a suggestion which he made about three remarkable trees which stand near each other on what was once part of the old Parsons' nursery-grounds in Flushing, Long Island. One of these is a specimen of the Golden Larch of China, Pseudolarix Kæmpferi, which is, probably, the first ever brought to this country, and is, without doubt, the largest now standing in America. Another is the celebrated Weeping Beech, whose hanging branches touch the ground in a circle nearly 200 feet in circumference. This tree was described and figured in the first volume of Garden and Forest, and it has long been known as one of the remarkable trees of the country. The third is a Purple Beech, which is also of magnificent proportions. It is doubtful whether three such noteworthy trees can be found standing together anywhere else in America, and Mr. Nicholson suggests that some provision ought to be made to keep them from being swept away before "the march of improvement," and that in some way they should become public property and be held forever for the enjoyment of the people of Flushing and of tree-lovers everywhere.

In many states there is no provision for transferring property to trustees to be held for public use. Massachusetts, however, has laws under which places which are interesting for their beauty and history can be so preserved, and, fortunately, a law was passed in this state in 1888 which enables any fifteen citizens, under certain restrictions, to secure land for public use independent of municipal authority. Such corporations can acquire property, by gift or otherwise, to the amount of half a million dollars, and they are clothed with the power of employing officers to enforce order in compliance with the rules they make. Any fifteen citizens of Flushing, therefore, under this act can organize as a body corporate with the power of succession to purchase or receive as a gift the land on which these noble trees stand, and they can hold and protect them with their surroundings and preserve them for the delight of present and future generations. We have nothing to add to this suggestion, as the details can well be left to the citizens of Flushing, a town whose exceptionally well-planted streets indicate a high degree of public spirit and an intelligent love of trees in general.

It is pleasant to see ourselves as others see us when they see us with pleased eyes. Therefore, we offer a translation of some passages from a letter published in a recent number of *Gartenflora*, and written on July 19th from Chicago by Dr. Wittmack, the editor of that journal, and an eminent horticulturist. The party to which he belonged went first to Mr. Henry Villard's place at Dobb's Ferry, on the Hudson. Of course, they were delighted with the Hudson, and declared that we do not overpraise it when we call it our Rhine, and he adds:

For hours we passed by the most beautiful places, which recalled somewhat those in the suburbs of Hamburg. Although only here and there did they equal these as regards stretches of turf and floral adornments, on the other hand they were often much more extensive and park-like. Indeed, the whole region resembles a park landscape. Mr. Villard's spacious grounds, like all the others, lie open to the public, even though it may come in carriages, a proof of liberality of spirit seldom found with us at home. The European plant-lover is much impressed when, for the first time, he finds growing wild the American trees and shrubs, and even many flowers, which he has hitherto known only as garden-plants. Here we saw the many kinds of Oaks, and there various species of Grape-vine in luxuriant growth, while in the grass grew Coreopsis, Phlox, etc.

Next we visited Sunnyside, sacred ground! Although the other parks are open to all comers, one must leave his carriage at the gate, and enter on foot the place which was once Washington Irving's home. His house is a veritable idyll, idyllically enveloped in ancient Ivy, grown from a sprout given to Irving by Walter Scott at Abbotsford. The most beautiful views open from this spot over the Hudson, which is much broader than the Rhine.

After a rhapsody on Niagara Falls, the writer refers again to the pleasure of seeing American plants in their native homes:

Here were the beautiful red-flowered Rubus spectabilis, Asclepias Cornuti, Grape-vines, Celastrus scandens, Phlox, etc., luxuriantly growing on the chalk rocks which form the upper verge of the river-bed. Especially interesting, however, were the high-stemmed specimens of Thuja occidentalis on Goat Island, partially torn, or even broken, by the wind, and exciting the admiration even of those who are not specially concerned with plants.

Finally we reach the Fair itself. The grounds seem so enormously large that all ordinary conceptions of distance must be considerably stretched, as, indeed, is everywhere the case in America. But the main thing is that the exhibition is great as well as large, and that he makes a mistake who condemns it as a whole. From the artistic and architectural points of view it is unsurpassed; no previous exhibition has shown so many bold and new forms in the buildings, the sculptures, etc.; and as regards size, the buildings leave all their predecessors far behind. The "White City" is, in truth, a wonderful city, and if one puts out of mind the hurly-burly of the Midway Plaisance, one must confess that it contains much that is great, good and beautiful. The horticultural display no longer deserves, as a whole, the criticism which it has called forth. The much-abused rockery, under the central dome of the main building, has become completely overgrown, so that one no longer perceives that it is made of canvas. I had expected to see something very different, it is true. I thought it would be a rockery like those we have at home, where only here and there groups of plants sprout forth, a big rocky hill with paths for the feet of the visitor. But it is not at all like this. It is an immense truncated pyramid, entirely covered with creepers and other plants, Musas, Pandanus, Palms, Aroids, etc.; and it is not accessible to the public, which may merely inspect a "crystal grotto" under the rock. It is true that at the foot of the mount the green boards, which form its support, still peep forth, and on close inspection one perceives a few rough boxes on which the Palms are placed; but in general all that is visible is green foliage.

Our German display makes a good impression, although at this particular time it is poor in flowers. It lacks Begonias, Cannas, and, above all, tall Palms. But other European lands are no better represented; indeed, only Belgium is conspicuous with the Azaleas of Monsieur Vuylsteke. The German open-air plants on the island are usually well placed; the Azaleas and Roses have bloomed well, the latter still bearing some flowers; the Cannas are coming on very irregularly and are remarkably behindhand; so, too, the tuberous Begonias, of which, in general, one sees few at the exhibition. The Stocks suffer from the heat, which, however, since we have been here, has been quite bearable. It is to be hoped that more effective displays will be here for the autumn weeks. It is melancholy that the proprietors of German nurseries should have been so wanting in public spirit, especially with regard to coniferous trees. From this department, where they might have made a fine display, they are entirely absent, and are put to shame by Waterer, of England, and by Moser, of Versailles, the consignment of the latter having been sold immediately to Kelsey, of New York, and being exhibited under the latter's name.

The displays in the fruit sections are really grand, and ought to improve as the weeks go by; and fruit-growers of Germany might learn from Americans how to exhibit fruit in an artistic manner.

Late Summer in the Pines.

DESPITE the unusual dry summer in the Pines, I see little, if any, appreciable difference in the abundance and beauty of the flowers. While our cultivated plants droop and suffer, the wild ones show no lack of life or lustre, and the varied hues of leaf and blossom seem as clear and fresh as ever. The Gentian family is now well represented among the plants in flower. The lovely Fringed Gentian, the Closed Gentian, Gentiana Andrewsii, and the Soapwort Gentian, G. Saponaria, are flowering on every side, and here, too, is the more exclusive G. angustifolia, with its narrow leaves thickly set along

the stem and an open corolla of a deep rich blue. Always excepting the Fringed Gentian, this is our most handsome species. The Sabbatias, too, are still beautiful among the Sedges and Grasses in the wet Pines. Both S. stellaris and S. gracilis are delicate and slender, and while they have a unique charm here on account of their appropriate setting amid their wild surroundings, one who studies them here can get many a hint for their effective use in decorating house-grounds. The white-flowered S. lanceolata is also here, but with its flat-topped cyme it is stiff and unattractive compared with its more graceful relatives. The Mist-flower, Eupatorium (Conoclinium) cœlestinum, has also a flat-topped inflorescence, but no one would charge its ageratum-like flowers with being stiff.

Our tall Swamp Lily, which well deserves its name Superbum, is now at its best, and its showy flowers tower above their humble companions in a grand pyramid of orange and scarlet. It is certainly one of the stateliest of Lilies. The Rose Mallow, the large flowering Hibiscus Moscheutos, also makes an impressive display of its great pink and white blossoms, which are larger and quite as showy as the cultivated Hollyhock, and many of them opening high above our heads. But the plant is rather coarse, or at least less graceful and delicate than the lower plants and Grasses around and below it. Still it attracts the attention of the most careless observer, and it is an important feature in many of our swamps and woodland-landscapes.

Both species of Trichostema, or Blue-curls, are here, with blue flowers and long exserted slender stamens prettily curled, from which peculiarity is derived the botanical as well as the common name of these plants. The foliage has a pleasant odor, like most of the other plants of the Mint family. Several of its relatives are now in flower. Among them is the strong-scented Horse-mint, Monarda punctata, gay with the highly colored bracts about its heads of flowers.

The brilliant scarlet of the Cardinal-flower glowing in the distance always indicates that we are approaching a pond, for it is by water margins that these plants flourish in the greatest abundance and brightness. None of our wild flowers are more vivid, and they never appear to better advantage than when they stand with an expanse of water dotted with white Pond-lilies on one side, and on the other a border of Sedges and Grasses and the delicate plants which they shelter. A slender little relative of the Cardinal is Lobelia spicata, with small blue flowers, and weak slender stems upheld by the Grasses. Another is L. puberula, with a stouter stem and a spike of large handsome blue flowers. And here, too, is the marsh Bell-flower, Campanula aparinoides, with dainty white bells scattered over the weak straggling plant, and holding on to the tall Grasses with the rough edges of its stems.

Along the border of the pond is Coreopsis rosea, with rose-colored rays and yellow disk. Some of the flowers are almost as handsome as the rose-colored Sabbatias. In the shallow water several forms of Sagittaria mingle with the Pickerel-weed. The pure white blossoms of the one and the blue of the other always group with good effect. The curious Eel-grass, Vallisneria spiralis, is now in flower. The water is so clear that we can see the staminate buds at the base of the long grass-like leaves two or three feet below the surface. Slightly agitating the plants we see the buds break from the short flower-scape and quickly come to the surface, where they soon expand to shed their pollen on the pistillate flowers, which are now raised to the surface on long spirally coiled stems to meet the loosened staminate flowers which are floating around them. After fertilization the thread-like stems become more closely coiled, so that the seed may ripen under water. Still more curious is the Bladderwort or Utricularia, of which there are several species here in the pond. Thickly scattered over the submerged stems are little bladders or utricles. We can see with the unaided eye untold numbers of small mosquito-larvæ, and also of the Chironomus caught in these utricles, never to be released, but to be slowly macerated and apparently absorbed by the plant. But we need the microscope to reveal the wonderful mechanism and structure of the utricles and to see how the various victims are caught and held.

Vineland, N. J. *Mary Treat.*

Notes on the Forest Flora of Japan.—XXI.

OSTRYA, the Hop Hornbeam, appears in eastern America with one species, one of the commonest of the smaller forest-trees of the northern states; the second species inhabits southern Europe, Asia Minor and the Caucasus; the genus has no representative in the Himalya forest-region, and, so far as I know, has not been found within the borders of the Chinese Empire or in Manchuria. It appears again in northern Japan, however, where the Hop Hornbeam is one of the rarest of Yezo trees. Maximowicz, who found it in the southern part of that island, considered the Japanese Ostrya a variety of our American species and called it Ostrya Virginica, var. Japonica.* The American and the Japanese trees are very similar in botanical characters; indeed, it is difficult to find characters to separate satisfactorily the species of this genus which might all be considered geographical varieties of one. The Japanese and American trees, however, look very differently in the forest, and there are differences in the bark which are not easy to express in words. The leaves of the Japanese tree are thinner and the heads of fruit are smaller than those on the American species (see figure on page 384). Unfortunately, I have not had an opportunity to examine the flowers of the Japanese tree; it is not probable, however, that they would afford a character by which the species could be distinguished. In the forests of Yezo I felt no doubt of its specific distinctness; the meagre and unsatisfactory material of the herbarium rather shakes than confirms this opinion. But, all things considered, it is, perhaps, best to consider the Japanese tree as specifically distinct. Only after it has been grown here during many years side by side with the American species will it be possible to reach any opinion on this subject worthy of much consideration. If it proves to be distinct it should bear the name of Ostrya Japonica. In the neighborhood of Sapparo the Japanese Ostrya is rare; here in low moist woods, growing with Oaks, Acanthopanax and Aralia, it sometimes attains a height of eighty feet and forms a tall straight trunk eighteen inches in diameter. We saw only one such tree, in the grounds attached to the headquarters of the Forest Department of Hokkaido, and only two or three other individuals; these were much smaller, perhaps not more than twenty feet high, and were scattered over the Sapparo hills. We saw nothing of this tree in southern Yezo or in northern Hondo, where Tschonoski, Maximowicz's servant and collector, found it in the high mountains of the province of Nambu.

Although poorer in species and less important in the number, size and value of individuals than in eastern America, Quercus furnishes one of the principal elements of the forests of Japan. The types are all of the Old World, and there is nothing in Japan which corresponds with our Red, Black or Scarlet Oaks, or with the Black Jack, the Willow Oak, the Shingle Oak, the Turkey Oak, the Spanish Oak, the Water Oak or the Pin Oak, the Blue Jack, or with our Chestnut Oaks. In the north and on the high mountains of Hondo there are four White Oaks, and in the south a number of species with evergreen foliage of sections of the genus, which are not represented in the United States. In the south, too, there are a couple of deciduous-leaved species with biennial fructification of the Turkey Oak (Quercus cerris) sort.

The best known of the Japanese Oaks to European and American planters is Quercus dentata (the Quercus Daimio of gardens). This tree is remarkable for the great size of its leaves, which are often a foot long and eight inches broad, obovate in outline and deeply serrately lobed, and for the long, loose, narrow, chestnut-brown scales of the large cup which nearly encloses the small-pointed acorn. In central Hondo this tree is only found on the high mountains, and it is not at all common, but in the extreme northern part of the island it appears in great numbers on dry gravelly slopes, at no great elevation above the sea. Here, apparently, however, it does not reach the size it attains farther north, and the finest trees we saw were on the gravelly plain south of Volcano Bay and in the neighborhood of Sapparo. The illustration on page 386 represents a group of these trees growing just outside of Sapparo and shows their habit at maturity. Although Quercus dentata grows to the height of at least eighty feet and forms

* *Mél. Biol.*, xi., 317.

a thick trunk more than three feet in diameter, it is not an imposing or handsome tree in its maturity and is only beautiful in youth. Old trees lack symmetry and the appearance of strength, and are sprawling in habit, without being picturesque. The bark is rather dark for a White Oak, and not unlike that of our Rock Chestnut Oak (Quercus Prinus); it is valued for tanning leather, but the wood is considered worthless. Quercus dentata appears to be the only deciduous-leaved Oak cultivated by the Japanese, and small trees are common in the gardens of Tōkyō and other southern cities, where, however, it seems to languish. A variety (pinnatifida), with deeply divided

Fig. 58.—Ostrya Japonica.—See page 383.

leaves, is cultivated in the Botanic Garden at Tōkyō, and has, I believe, been introduced into Europe.

In central Yezo two noble White Oaks, Quercus crispula and Quercus grosseserrata, form a considerable part of the forest-growth. The Dutch botanist Miquel considered them forms of one species, but Professor Miyabe, who has had the best opportunity for studying these trees under the most favorable conditions, believes them to be distinct in their fruit, although similar in foliage. In Quercus crispula he finds "the cup deeper, embracing about half the cylindrical nut, falling off with it when ripe; while in the latter, Quercus grosseserrata, the cup is hemispherical, enclosing about a third of the oblong ovoid nut, which falls off free when ripe." His view, too, that Quercus grosseserrata cannot be specifically distinguished from the Saghalin and Manchurian Quercus Mongolica, will probably be found to be correct. Quercus crispula appears to range farther south than Quercus grosseserrata, which extends north to the Kurile Islands, and was not recognized by us in Hondo; in the Nikko Mountains, on the road to Lake Chuzenji, we saw fine forests of Quercus crispula. In central Yezo, where the two species grow side by side on the hills, on low ground, near the banks of streams, Quercus crispula appears the more common tree. Both have elliptical or obovate-oblong, coarsely and irregularly lobed leaves, resembling in color and texture those of the common Oak of Europe. The bark is pale, or sometimes dark, and scaly; and both species under favorable conditions rise to a height of eighty to a hundred feet, and produce stems three to four feet in diameter. Both are timber-trees of the first class, and both, should they thrive in this country, may be expected to add beauty and interest to our parks and plantations. The smaller, shorter acorn of Quercus crispula appears to offer the only character for distinguishing the two trees; in their port, bark and foliage they were indistinguishable to my eyes.

The fourth Japanese White Oak, Quercus glandulifera, ranges in Yezo nearly as far north as Sapparo, although it is only south of Volcano Bay that it is really abundant. This, the common Oak of the high mountains of central Japan at elevations over three thousand feet, is probably the most widely distributed species of the empire; it is a pretty tree, rarely more than thirty or forty feet high, although on the hills above Fu-kushima, on the Nagasendo, we saw specimens nearly twice that height. The leaves are narrowly obovate or lanceolate-acute, glandular-serrate, pale or nearly white on the lower surface, and from one to four inches in length. The acorns are small, acute and enclosed at the base only by the shallow, thin-walled cups covered with minute appressed scales. Like many American Oaks, this species varies remarkably in the size of individuals, and in some parts of the country traversed by the Nagasendo we found plants only a foot high covered with acorns. This Oak was sent to the Arnold Arboretum many years ago from Segrez by Monsieur Lavalleé. It is perfectly hardy here, and has flowered for years, although it remains a bush, and makes no attempt to grow into a tree.

Of the other deciduous-leaved Oaks, Quercus serrata, one of the most widely distributed of the Asiatic species, ranging, as it does, from Japan to the Indian Himalaya, is common in dry soil near the coast below Yokohama and on the foot-hills of the mountains of central Hondo. It is a small tree, twenty to forty feet high, with a slender, black-barked trunk and beautiful dark green, lustrous, oblong, acute leaves, their coarse teeth ending in long slender mucros, and with small acorns enclosed in cups covered with long, loose, twisted and reflexed scales coated with soft pale tomentum. In Japan this tree appears to spring up in waste lands in great numbers; it is only valued for the charcoal which is made from it.

Quercus variabilis, a nobler tree of the same general character, we only saw in the grounds of a temple near Nakatsu-gawa, on the Nagasendo, where there were specimens fully eighty feet high, with tall straight trunks three or four feet in diameter, covered with thick, pale, corky bark, which is sometimes used by the Japanese for the same purposes that we use the bark of the Cork Oak. The leaves are oblong-oval, pointed, less coarsely toothed than those of Quercus serrata, dark green and lustrous above, and pale, or nearly white, below. From Quercus serrata, too, it differs in the smaller cups and in their shorter, thicker scales. A number of plants have been raised in the Arboretum from the acorns which we picked up under these trees, and if they are not hardy here in New England they will certainly thrive in the middle states.

It is impossible to know whether many of the evergreen Oaks which we saw in Japan were growing naturally or had been planted. In the gardens and temple grounds of Tōkyō, Yokohama, Kyoto and other southern cities evergreen Oaks are the commonest trees, but we did not see them growing in the forest except near temples. The species most frequently seen in Tōkyō and Yokohama are Quercus cuspidata and Quercus glauca; they are both large and beautiful trees, said to be particularly conspicuous in early spring from the bright red color of their young shoots and new leaves which at that season make a charming contrast with the dark and lustrous green of the older foliage. They should be introduced into our southern states, where, probably, all the Japanese evergreen Oaks will flourish. The wood produced by Quercus cuspidata and Quercus glauca does not appear to be valued in Japan, but the acorns of the latter are of considerable commercial importance, and are cooked and eaten by the Japanese.

Quercus acuta, which is also much planted in Tōkyō, we saw growing to the height of more than eighty feet, with Quercus variabilis, in the temple-grounds at Nakatsu-gawa, and also near the temple of Higane, near Atami, on the coast. It is a noble tree, with ovate, acute, long-pointed, dark green, thick and lustrous leaves. This noble tree has been introduced into English gardens, with a number of other evergreen Japanese Oaks, through the efforts of the Veitches, who obtained it some years ago from their collector, Maries. But the finest Oak-tree, and perhaps the finest tree which we saw in Japan, was a specimen of Quercus gilva in the temple-grounds at Nara, where there are a number of remarkable specimens of this beautiful species, which is distinguished by its lanceolate-acute leaves, glandular-serrate only above the middle, bright green above, and thickly coated below, like the young branches, with pale, or slightly ferrugineous, tomentum. The largest of these Nara trees was probably a hundred feet high, with a trunk covered with pale scaly bark, which, breast-high from the ground, girthed just over twenty-one feet; it rose without a branch, and with little diminution of diameter, for something like fifty feet, and then separated into a number of stout horizontal branches, which had not grown to a great length, and formed a narrow, cylindrical, round-topped head.

Of the other Japanese Oaks, Quercus Thalassica, Quercus Vibrayiana and Quercus glabra, we only saw occasional plants in gardens. The Quercus lacera of Blumé we did not see at all.

C. S. S.

Foreign Correspondence.

London Letter.

TECOMA MACKENII.—A small plant of this beautiful species of Tecoma is now in flower at Kew, and, so far as I know, this is the first time T. Mackenii has flowered in England, although it has been in cultivation here many years. It is a native of Caffraria, in south Africa, where it was discovered about thirty years ago by Mr. A. White. Plants of it were soon afterward sent to Kew by Mr. McKen, curator of the Botanical Garden at Durban, in Natal, and it was also widely distributed in the gardens of south Africa, where it has since become a great favorite. When I visited Grahamstown in 1887, T. Mackenii was one of the most strikingly beautiful of the many plants I saw there. The finest specimen had taken possession of an old trunk of Erythrina Caffra and had formed a great sheaf of shoots ten

feet through and fifteen feet high. It was not even in an enclosure, but stood on a piece of waste ground by the side of the road. I saw it in full flower, and there were hundreds of very large racemes of trumpet-shaped flowers quite three inches long and broad, colored bright rosy-lilac, with a few darker pencilings and a blotch of yellow in the throat. The mass was a glorious picture, such as I had never seen made by any Bignoniaceous plant. We have tried to get it to bloom at Kew, but, although it grows as freely as Ivy in a cool, sunny greenhouse, it has never produced any flowers. Last year some cuttings of it were struck and treated in the way that has made other species of Tecoma bloom when small, namely, by restricting the roots and placing the plants in a sunny position out-of-doors all summer; in the autumn the shoots produce bloom. Of course, these small plants do not form such enormous racemes as do large specimens. I have no doubt that in the southern states of North America T. Mackenii would grow outside and flower as freely as it does in south Africa. Flowers of this species were sent to Kew three years ago by Mr. Hanbury from his garden at Mentone, on the Riviera. The only figure of the plant of which I know is a very poor one in the *Bulletin of the Tuscan Horticultural Society* for 1887, where it is called T. Ricasoliana, having been figured from a plant flowered in the garden of Monsieur Ricasoli, at Casta Bianca, Monte Argentario, in 1886. This plant was said to have been raised from seeds sent from Buenos Ayres, and this suggests that it has been introduced as a garden-plant into that country. It has also been distributed under the name of T. rosea, Mr. Bull describing it under this name among his new plants of 1886 as "a remarkably handsome greenhouse climber, imported from south Africa, with opposite pinnate leaves and magnificent racemes three to four feet in length, of large, showy trumpet-shaped flowers of a rosy-lilac color." There is a plant at Kew which was sent from Grahamstown in 1879 under the name of T. Mackenii.

Hedysarum multijugum is one of the most ornamental of the hardy shrubby species of Hedysarum, one might almost say of the order Leguminoseæ itself, for it grows rapidly, forms a loose, elegant shrub three to five feet high, clothed with gray-green pinnate leaves six inches long, and bears numerous axillary erect racemes a foot or so long, of pea-like flowers nearly an inch across and colored rosy-purple, with a yellow blotch on the standard. They have been aptly compared to the flower-spikes of Swainsonia galegifolia. Every leaf axil develops a raceme, and thus there is a continuous display of flowers from May to September. It was introduced about ten years ago from the deserts of southern Mongolia. A figure of it may be seen in *Gartenflora*, t. 1122. For sunny positions in light or, indeed, almost any kind of soil, this shrub has special value. It appears to be quite hardy, at any rate the plants at Kew in a sunny border have not been injured by the severe frosts of the last few years.

Æsculus parviflora, or, as it is better known in our catalogues, Pavia macrostachya, is one of the most ornamental of all the Horse-chestnut family. I suspect it is common enough and in favor in North America, but it is neither the one nor the other in England, notwithstanding its good nature and floriferousness. Specimens eight feet high and wide have been pictures at Kew for the last six weeks, but by most visitors they have been looked upon as botanical rarities only. It has been in cultivation in England nearly eighty years.

Eucryphia pinnatifolia flowered freely a few weeks ago, but it appears to dislike bright sunshine and hot dry weather, the plants at Kew having suffered recently in spite of copious waterings during the drought. I suspect all of these Chilian shrubs prefer a position where there is not much bright sunlight and a good deal of moisture. Such, at any rate, suits the Lapageria, Philensia, Tricuspidaria and Berberidopsis corallina. This last is growing well, and has flowered profusely this year on a wall facing east. Eucryphia Billardieri has lost every leaf through the scorching heat of the last fortnight. It is planted against a south wall, a position which, from its habitat, Tasmania, ought not to have been too hot for it.

Fig. 59.—Quercus dentata, in Yezo.—See page 383.

HYDRANGEA PANICULATA.—This plant is valued here chiefly as a useful pot-shrub, which may be forced into flower in early spring. It is, at least, equally valuable as a lawn-shrub, as has been very fully exemplified this year at Kew, where a large round bed on an open position on a lawn is filled with plants four feet high, which for nearly two months now have been clothed with great bunches of dazzling white flowers. We are apt to overlook the fitness of many things for the shrubbery and lawn if we begin by growing them in pots for the greenhouse, and this Hydrangea is an instance, so far, at least, as English horticulture is concerned. There has been no more effective shrub at Kew this summer than H. paniculata.

[The sterile form of Hydrangea paniculata, known in gardens as Hydrangea paniculata grandiflora, has become one of the most popular and universally used shrubs in the United States in a surprisingly short time. It probably originated in Japanese gardens, where it is much less valued than it is here. The wild forms of Hydrangea paniculata, with only the outer flowers of the cluster sterile, are less commonly seen in this country, although many persons now consider them more beautiful than the plant with the huge clusters of sterile flowers. There are two quite distinct forms. The first flowers in July, and produces smaller panicles with small ray-flowers, and is, perhaps, a distinct and undescribed species; it was sent to the United States by the late Thomas Hogg. The second is now in flower with the sterile form, and produces immense, erect, broad panicles, with few large ray-flowers. The three forms are all hardy, grow rapidly and flower profusely. The early-flowered deserves to be much better known in our gardens than it is at present.—ED.]

THE ROYAL BOTANICAL SOCIETY of Regents Park is in a tottering condition, and is like to fall. Its finances are in a hopeless state, and its work during the last few years has been such as is not likely to win much sympathy either from horticulturists or botanists. The general feeling is that there is no need for a botanical collection in Regents Park, when all that can be desired is to be seen and obtained a few miles away at Kew. On the other side, the assistance the society has tried to render to horticulture by means of exhibitions has been almost superfluous now that the Royal Horticultural Society is in vigorous activity again. It would appear, therefore, that London does not require such a society as that which has for so long held its meetings in the enclosure at Regents Park. The suggestion that the Botanical Gardens should be recovered by Government and added to the park appears to be the best course. It is scarcely likely that the £18,000 debt of the society will be subscribed by a public unable to see the utility of the work done by the society in recent years.

THE ROYAL HORTICULTURAL SOCIETY is this year extending its operations to the other side of the metropolis, having arranged for a great exhibition of plants, flowers, fruits and garden requisites of all kinds in the extensive Agricultural Hall at Islington. I learn that there is every promise of a great display, and as the exhibition will be open four days, from August 29th to September 1st, and the neighborhood is a densely populated one, there is a probability that many thousands will visit it.

CO-OPERATIVE GARDENING.—The sixth annual exhibition of the Co-operative Agri-Horticultural Association was held at the Crystal Palace last week, and proved a great success. The object of this association is a most laudable one—namely, the encouragement of horticulture and agriculture among the working classes. Three hundred pounds in prizes is given, and so general is the interest that no less than 4,077 entries were made, the exhibits covering nearly three-quarters of a mile of tables in the Palace Hall. In the workmen's section there were 1,202 entries of vegetables alone, and 744 of cut flowers, 240 of fruit and 224 of plants in pots; there were also 129 exhibits staged by women and children. Such plants as Ferns, Begonias, Balsams, Fuchsias, Musk and Pelargoniums were largely represented, and generally they showed considerable cultural skill. Vegetables, too, were, on the whole, good, and fruit was in some instances worthy of first-rate gardens. The success of such an exhibition is in the amount of pleasure it gives and the interest it inspires among the exhibitors themselves. The result cannot be other than to promote a love of plants and flowers and a knowledge of the art of growing them among those who have greatest need of the pleasure and profit which good gardening brings.

London. *W. Watson.*

Cultural Department.

Crinum Powelli.

THE Royal Botanical Gardens at Glasnevin, near Dublin, have long been famous for horticultural successes, and one of these is the splendid collection of Crinums, formed by the present curator, Mr. F. W. Moore, and established in a south border against a range of plant-houses. A correspondent, who saw these plants in June, wrote us at the time in praise of their excellent growth and the admirable flowers which some of them were already bearing, and Mr. Moore himself contributed a note on the plants to the *Gardeners' Magazine*, which contained so much useful information that we give it entire. Although Dublin is nearly thirteen degrees farther north than New York, its mean annual temperature is a few degrees higher, and its other climatic conditions are so different from ours that it is hardly probable that these Crinums would be hardy here. Farther south they may be expected to flourish, but they can easily be kept over winter and make admirable decorative plants for outdoor use here in summer.

During the bright aad sunny weather of June no hardy plants have attracted more attention in Glasnevin than Crinum Powelli and Crinum Powelli alba. Fortunately, both these may be described as hardy plants, for, whether planted in the open border or in a sheltered warm corner, the severest winters experienced at Glasnevin have not in any degree impaired their vitality, or permanently injured them. Nothing worse has happened than a browning of their old leaves, while these disappear, to be replaced by a crown of fresh and vigorous foliage in April. Then come the flowers. They first open in June, and the early frosts of October find some still remaining. The history of Crinum Powelli and its varieties is well known. For many years Crinum longifolium had been cultivated out-of-doors in British gardens, and had proved to be quite hardy. In 1863, the late Dr. David Moore obtained seeds of a Crinum which proved to be a new species, and is now known as Crinum Moorei (*Bot. Mag.*, plate 6113). This, when tested beside C. longifolium in a special border in the open air, grew freely and flowered, survived the winter, and though more or less injured by the frosts, it has continued to thrive where it was first planted more than fifteen years ago. Mr. C. B. Powell crossed together C. longifolium and C. Moorei; the result of this cross gave to our gardens C. Powelli and the beautiful plant C. Powelli alba.

To fully appreciate the excellence of these plants, one must see a clump which has been properly planted and left undisturbed for some years. Such a clump outside the Orchid-house at Glasnevin, consisting of six bulbs, has fourteen flower-scapes, two of which have twenty-three flower-seats, the tallest of these scapes being three feet six inches high, and the largest leaf five feet six inches long. Beside this clump Crinum Powelli alba has a scape with twenty flower-seats. It must be understood that all these flowers do not open simultaneously. Six is the largest number I have counted open at the same time, but a circle of six waxy beautifully formed flowers, either deep rose or pure white in color, each flower measuring six or more inches across, forms a sight not easily to be forgotten, and makes one feel deeply indebted to the raiser for adding such a treasure to the list of garden-plants.

To succeed thoroughly in growing Crinums in the open air, two points need attention—plant deeply, and plant in good well-drained soil. Some of the Crinums require to be planted quite three feet deep, and C. Powelli likes to be at least two feet down—that is to say, the base of the bulb to be two feet below the surface. Even, if when planting, the bulbs are not two feet long, plant at that depth, and they will soon not only grow to two feet, but extend for quite another foot above the surface, and so planted they here require no protection whatever. Outside

the stove a special border has been prepared for Crinums. The hot-water pipes inside are close to the wall, so that a considerable amount of heat must pass through to the Crinums on the outside. In this border the following species are planted, all of which have survived one or more winters, and many of them flower annually: C. Americanum, southern United States; C. amabile, Sumatra; C. Careyanum, Mauritius; C. latifolium, tropical Asia; C. lineare, Cape; C. Moorei, Natal; C. pratense, India; C. pedunculatum, Australia; C. Yemense, C. variabile, Cape; also the following supposed hybrids: C. Melazzi, C. Meldense and C. grandiflorum Silberi. The first species to flower each year is C. amabile, some of the scapes having fifteen flowers. The last to flower is C. Moorei. C. latifolium had a scape five feet high, and leaves eight feet long and seven inches broad.

Chrysanthemums.

THE interest in Chrysanthemums increases as the season advances, and the progress and development of the buds is a study in itself. It is only by noting the condition and development of the buds of new varieties that we can tell their value, and how to treat them the next season. In old varieties we decide at this time what buds to take and what to discard. The crown-bud, so called because it terminates the growth at a certain stage, differs from all other flower-buds from the fact that it is never subtended by other flower-buds. This latter condition always occurs in "terminals," so designated because, terminating the growth, no more buds develop. The crown-bud is an abortion at best, and would seldom develop if left to itself. It only does so when three or more buds, which develop below it (ultimately becoming terminals), are removed. This is the process of "taking" the crown-bud. Taking terminals merely consists in removing side flower-buds and leaving one only.

Some varieties show a crown-bud early in May. This is the case with W. H. Lincoln. All such buds should be discarded. The August crown-bud is the best to take in certain varieties required for exhibition, and of which we know the time required to develop the buds properly. This is really the only crown-bud to produce a good exhibition flower in some varieties, notably E. Molyneux. It is not probable, however, that the process of timing and taking the bud will ever become popular on this side of the Atlantic. It is too slow and requires much calculation; besides, one is always sure of flowers on terminals. Unless we know how and when to properly take a crown, a terminal is the best bud, and for commercial purposes it is certainly the best. A rule among the commercial class of growers, where any attention is paid to the matter, is to take crown-buds on weak varieties and terminal buds on stronger-growing varieties. I generally take a few of each, especially in the case of new varieties, and recommend those who can take time enough to study and follow the matter out in all its practical bearings, to follow this plan, noting whether the buds were taken early or late and the results.

What we aim at in specimen plants is to develop as many growing shoots as possible before the middle of August, regulating them so as to keep the plant well balanced, and tie them out into a shapely specimen by blooming-time. Too often plants are allowed to grow naturally, no attention being paid to outline until a few weeks before exhibition-time. It is impossible then to get the neat specimens. Generally, all the shoots on a specimen plant are terminals, and bear a number of flower-buds in clusters at the tips. I prefer to leave only one bud, and this treatment is repaid by extra-large flowers. It is difficult, however, to persuade people to leave but one bud. I have noticed the tendency in a few varieties, notably M. J. Delaux, G. Daniels and Amber Gem, to show all crown-buds at taking-time. As this occurs well into September, I always take them; if these were removed terminals would come, but it is questionable whether, so late in the season, these would be as good. I would advise that all crown-buds appearing on specimen plants in September be taken.

Feeding should continue until all disbudding is done. One good guide as to whether the material used is beneficial, besides noting its visible effects, is to observe whether new roots run over the surface of the soil. The absence of these, taken in connection with a yellowish shade on the leaves, is a sure indication that the plants are out of health, and instead of increasing the dose of manure on these plants they should be passed by. If there is room, a light top-dressing of pure loam would benefit them, and I recommend this treatment generally for all that are not doing as well as they should. Too much water and poor drainage are generally chargeable with an unhealthy condition. It is better in such cases to withhold water, giving only enough to keep the plants alive, until signs of returning color appear. I have tried this plan with good results. Plants should be moved in early in September and a little fire-heat used—just enough to keep out mildew.

Wellesley, Mass. *T. D. H.*

Seasonable Vegetable Notes.

CELERY will need a little finely pulverized earth laid up to it every week or so from this time. We never earth it up much at a time, but bank up a little and often. Before banking all decayed leaves should be removed, and with them a few of the lower hard leaves. If two or three persons can be set to work, one should draw in the leaves as closely as possible, while the others pack the soil firmly about the plants. If one alone must do the work, the plants should be tied up ahead. We generally do our last earthing about the first week in October, and expect to store the celery by the 1st of November.

Onions, excepting the late sown, will now have made their season's growth, and should be drawn and put in a sunny place to dry. It is customary where large quantities are grown to windrow them on the beds; but, as we grow only a few for home use, we lay them on old boards or shutters, and cover them during bad weather. Carefully dried onions keep better.

Every year we sun-dry a quantity of Lima beans. It is a slow process, but fully worth the trouble. These beans, steeped for a few hours before cooking, come out for table use as fresh as in summer-time. We find Henderson's Bush Lima an excellent kind to grow for this purpose. It is early, and gives us a picking or two before the pole varieties come in, and after that we use them for drying. Our Strawberries are already planted, and the last sowing of Prickly Spinach will now be made for spring use, to be wintered over covered with litter. The time for sowing Lettuce in frames has now arrived. Tomatoes planted late in frames have outgrown their limits, and are being pruned of all but fruit-bearing growth. Frost is liable to strike us at any time during September, and squashes should be gathered, so that they may be covered when there is danger of frost, as also peppers and green tomatoes.

Watertown, Maine. *W. D.*

Begonias.—I agree with Mr. Gerard, that tuberous Begonias in the sun are a failure. Under certain conditions they do very well, but to the lover of a trim bed they are not a success. Lately I saw a bed around the trunk of a Beech-tree, well, but not densely, shaded, since the lowest branches were considerably above the bed. With a good mulching, and plenty of moisture, a majority of the plants had done well. These plants flourish on the shady side of a hedge, but they seldom succeed along the walls of a dwelling. As your correspondent suggested, there are many other Begonias which answer this purpose better. I have in mind a very effective bed at the northern end of a conservatory belonging to Mr. Simpson, of Saxonville, Massachusetts, in which Begonias were an important feature. With these there were growing several Ferns, Adiantums, Nephrolepis and Onychiums and some Dracænas, Aspidistras and small Palms, altogether making a picturesque effect. The Begonias most available are Bismarck, Semperflorens in variety, Insignis, Guttata, Diademata, Rubella, Ricinifolia and Verschaffeltia.

Hartford, Conn. *R. Dale.*

Correspondence.

Treatment for a Decaying Ash-tree.

To the Editor of GARDEN AND FOREST:

Sir,—An Ash-tree here, eight feet in circumference at the base, growing through a gravel walk and showing no signs of decay in branches or foliage, is unexpectedly found to be entirely hollow some three feet below, and for about the same distance above, the ground, the cavity being partially filled with rotten wood and innumerable yellow ants. The sap-wood seems fairly sound, except for a honeycombed appearance. The hole in the tree is where a large root has decayed and worked upward on the trunk, making a cavity about eighteen inches square. It is impossible to remove the dead wood and the live ants by hand, and it is also impossible to treat the inside properly if this should be done. The holes in the wood indicate borers, followed by tree-ants. Can tree-ants be destroyed by smoking, and can sulphur be used with safety? Would the heat of burning kerosene injure the tree? Should the hole in the ground below the tree be filled, and with what? Should an attempt be made to exclude dampness and air from

the large hole in the tree? The sound wood in the trunk appears to be from four to six inches through at the base. Is this enough to support the tree against strong winds in an exposed position?

Winchester, Mass. *W. T. Sanborn.*

[The hole in the tree should be cleared as far as possible of the dead and decaying wood, the soil being removed from about the trunk for the purpose, and the surface should then receive a good coat of coal-tar; borers, if they are found to exist, should be killed by probing their holes with a sharp wire. The edges of the cavity should then be made smooth and even, and then into the cavity should be fitted as tightly as possible a piece of oak-plank, on which should be spread a coat of coal-tar. The soil should then be put back about the base of the trunk. The coal-tar should be renewed every year or two to prevent the wooden covering of the cavity from decaying. A healthy growth will spread from the margin of the cavity, and eventually may be expected to cover it. The ants are not the cause, but the result, of the decay, which will stop when the air and moisture are excluded from the cavity; they can be driven out by fumigating with tobacco-smoke or with fumes of sulphur.

The tree is, of course, weakened by the internal decay of the trunk, and is more liable to be broken off by the wind than a perfectly sound tree would be. It may fall with the first severe gale, or it may stand for years. The object of the plank-stopper is to afford a surface for the new growth from the margins of the cavity to spread over and to exclude moisture from the cavity while the protecting layer of new wood and bark is growing.—ED.]

Rudbeckia purpurea.

To the Editor of GARDEN AND FOREST:

Sir,—Rudbeckia purpurea has been highly commended twice in your columns. Will you kindly inform me if it is a native of any part of the United States? I do not find it in any botany.

Boston, Mass. *Howard P. Arnold.*

[Rudbeckia purpurea, or, as it should more properly be called, Echinacea purpurea, is a native of the United States from Virginia and Ohio to Illinois and Louisiana. A description and full synonymy of the plant, with reference to published figures, will be found in Gray's *Synoptical Flora of North America*, vol. i., part ii., p. 258.—ED.]

The Columbian Exposition.

The Nursery Exhibits in the Midway Plaisance.

NEAR the east end of the Midway Plaisance, two and a half acres, divided by the street, are devoted to nursery exhibits. It was originally intended to devote a larger area to this industry, but, owing to delay in preparing it and the disinclination of nurserymen to make displays so far removed from the main part of the Fair-grounds, the plan was abandoned this spring, and the present area was hastily put in order. The soil is sandy, and none of the stock was set until May, so that the exhibit is necessarily poor. The fruit-tree nurserymen of America are wholly unrepresented. In fact, the only really worthy American effort at nursery display is made by Ellwanger & Barry upon the wooded island, and this exhibition is confined to ornamental plants. Once it was proposed to have American nurseries in actual operation, from the raising of the seedlings to the budding and grafting and the handling of marketable trees; but the time was too short for accomplishing so much, and the nurserymen were not inclined to respond quickly. As it is, the nursery-grounds in the Plaisance are occupied chiefly by California with a citrous orchard and various specimen plants, by a mixed collection from Mexico, three exhibits of evergreens by Illinois and Wisconsin nurserymen, and displays by five French firms.

California fills about half the entire area. This display makes little attempt to show nursery stocks or methods. The greater portion is an orchard of Oranges, Lemons and other citrous fruits, and is really a mate to the small orchard in the north court of the Horticultural Building. Many of these trees now bear nearly full-grown fruits, the product of flowers which appeared before the trees were set in their present quarters. Mediterranean Sweet Oranges, Villa Franca Lemons and some others are set fairly well with new fruits from the flowers which appeared in June. Still the trees have not set fruit to the extent which the flowers promised, and Mr. Robert Pegg, the chief gardener of the California exhibits, thinks this failure due to the absence of bees. A Villa Franca Lemon-tree, which was six months old when set in the Plaisance, is now bearing fruit upon the subsequent growth. Many interesting single specimens of various plants are comprised in the collection. Among the best is a tree of Grevillea robusta, twenty feet high and six inches in diameter at the base, and some Pepper-trees, Schinus mollis, both of which are popular street-trees in southern California. The Loquat is also conspicuous, and the sides are interspersed with Roses, Lantanas and Polygalas, and interesting specimens of Aralia papyrifera, Phœnix dactylifera and P. Canariensis, Chamærops excelsa and the Umbrella-tree, Melia Azaderach.

The most conspicuous feature is the display of Mexico, contributed by Gustave Schiebe, of the City of Mexico. This collection arrived very late, and the continued drought has shortened its growth. Yet the plants are so novel to northern eyes that the plot has unusual interest. A mere list of some of the more conspicuous plants will show the character of the exhibit and indicate the kind of plants which the Mexicans grow in the open: Coffee, Sarsaparilla (Smilax), Musas, Begonias, Ficuses, Macrozamia Mexicana, Clerodendron (Volkameria) fragrans, Cacti, Rivina humilis, Dioon edule, Anthuriums, Sanchezia nobilis, Citrus myrtifolia, Cestrum coccineum, Ardisia Mexicana, Datura arborea, Senecio elegans, Poinsettia pulcherrima, Pachira fastuosa, Guava in fruit, Hibiscus Chinensis, Jambosa (or Eugenia) vulgaris, Cinchona, Bescharneria yuccoides, Logwood (Hæmatoxylon Campechianum), Cibotium (or Dicksonia) Schiedei and C. nigrum.

At the end of the Mexican section, Martin Klein & Co., of Detroit, show a few bushes of the "Dwarf Cherry," a plant which the vender supposes to have come originally from Japan, but which is the common wild Prunus pumila of the northern states. I have long been convinced that this little Cherry has merit as a fruit-plant, and I am glad that it is being prominently advertised here; yet it seems to be urged for some supposed medicinal value, founded largely upon the vivid red color of the roots, rather than for its fruit. It is said that the bush has been planted rather largely, one person in Michigan having 45,000 plants set in a regular plantation. Prunus pumila should not be planted indiscriminately, because it is a variable plant and many of the forms are utterly worthless for fruit. As soon as named varieties appear we may expect confidence on the part of nurserymen and growers.

A Cranberry-bog in full operation attracts much attention. It is shown by A. C. Bennett & Son, Appleton, Wisconsin. A raised border, a foot and a half high, surrounds the little bog, and a small reservoir for water lies at one side. The water is conducted from this water-head through a gate, when it runs through the ditches which surround the four beds of Cranberries. These beds are each about ten feet square, and are bearing fairly well.

The chief attraction in nursery displays, however, is in the French section, where displays of fruit-trees and a very few ornamentals are shown by Pinguet-Guindon, of Tours; Ausseur-Sertier, of Liensaint; L. Paillet, of Vallée de Châtenay, near Paris; Honoré Defresne et Fils, of Vitry, and Croux et Fils, of Sceaux. Most of the fruit-stock in these displays is trained in various fashions to fit it for growing upon walls or espaliers, or as globe-headed tall trees to stand in the centre areas of small gardens. The method of training Apples, Pears and other fruit-trees on wires, much after the manner of training Grapes, is rarely seen in America, but in the confined areas of European countries it is common. The fruits which are obtained from these little trees are large and excellent, and usually sell for fancy prices. An Apple-tree which is trained to a one-arm cordon, the arm being eight or ten feet long, may be expected to mature from six to a dozen fruits. Of the better varieties, these fruits sell for one to three francs apiece in midwinter. This is especially true of Colville Blanc, which is one of the best varieties and a long keeper. A French gardener informs me that he sold a basket of these apples, containing twelve fruits, for forty-five francs last February. It is interesting to note how different the varieties of these French trees are from our own fruits. Among Apples one notices the varieties of high quality and difficult culture. There are Colville Blanc, Colville Rouge, Pigeon de Rouen, Reinette de Caux, Reinette du Canada, Reinette de Granville, Reinette Franche, Reine des Reinettes and Pomme d'Apis (Lady Apple). Among Peaches are Bon Ouvrier, Madeleine de Courson, Alexis

Lepère, Madeleine Rouge, Précoce de Hale (Hale's Early), Brugnon Violet. Of Pears, prominent kinds are Passe Crassane, Beurré Hardy, Président d'Estaintos, Beurré d'Hardenpont, Beurré Superfin and Doyenné Blanc. Plums, Apricots, Cherries, Grapes upon American roots and stocks of the St. Lucie (Mahaleb) Cherry are also conspicuous. It must be a matter of chagrin to Americans to know that the only important exhibits of fruit-tree stocks are from France; and that there are no exhibits whatever from any source of small-fruit plants.

Chicago, Ill. *L. H. Bailey.*

Notes.

Among the new Cannas there is not one with brighter flowers than the comparatively new Sarah Hill. These flowers have neither spots nor margins of any other color, but are a solid crimson. A mass of them in a large vase produces a glowing effect which can hardly be described.

The wooded island at Jackson Park is now resplendent with flowers, especially of plants belonging to the Sunflower tribe, which give such a distinct flavor to the American autumn. They do not suffer in comparison with the stiff-blooming Hydrangeas, which are also conspicuous now. The island is very dry and all the plants are suffering seriously, but the Sunflowers are among those which are injured least.

Quebec is now showing many good specimens of the Montreal market muskmelons at the World's Fair. Some of the Canadian growers have achieved great success with these melons. They are round, ribbed and netted, of the Hackensack type, but are very large for a northern melon. One now upon the shelves weighs twenty-five pounds two ounces, and another twenty-four pounds seven ounces, while many others nearly reach these figures.

Of the melons in the New York market the old Hackensack, or some improved forms of this variety, still holds the first place among the green-fleshed varieties. The smaller green-fleshed varieties are all called Nutmeg in the market, although they include such good varieties as Netted Gem. In the same way all the salmon-fleshed sorts are called Christiana, under which name the Emerald Gem is often sold, a melon which, in texture, dissolving quality and delicious flavor, is all that can be desired.

In a collection of native hardy plants the Liatris, or Blazing Stars, which bear rosy purple flowers, are now quite effective. L. scariosa is about the handsomest species, because it has larger heads and bright reddish scales, although its spike is not so long as that of L. spicata, which commences to bloom earlier. L. pychnostachya has spikes sometimes twenty inches long. One detraction from the value of some of the Liatris is the fact that their flowering begins at the extremity of the spike and progresses downward, and, therefore, while the lower flowers are in full beauty the spike terminates with fruit or withered flowers.

Professor Selim Lemström, of the University of Helsinfors, Finland, a person well acquainted with the life and products of Europe, is now traveling in this country for the purpose of making observations concerning our agricultural products and science related to rural affairs. The most striking peculiarity of the daily life of our people, which he has observed, is the abundance and variety of food which even the poorer classes enjoy, and especially the great amount and excellence of fruits which they consume. He declares that in no European country, not even in Italy, are there such excellent fruits, nor are they used to such an extent as a daily food. He is impressed with the fact, however, that the Americans do not cook fruits in so many appetizing ways as the Europeans do, a circumstance which is partly due, no doubt, to the almost uniform excellence of our fruits for consumption in the natural state.

Among the shrubs which carry their flowers into September the late-blooming form of the Tamarisk is among the most desirable, and it is altogether better than the forms which, under a variety of names, but with differences which are inconspicuous to the general observer, bloom in late spring and early summer. When strong plants of the late-flowering Tamarisk, which is generally known as T. Indica, are cut back hard in early spring, they will throw out long, straight wands from six to eight feet long in a season, and their small pink flowers and buds among the foliage at the extremity of these pliant branches give an unusually graceful aspect to the shrub at this time. Its flowers are only one of its good points, for the soft foliage of masses of this plant produces a very agreeable effect all summer long. The Tamarisk has the special merit of being a good sea-side shrub, as it is able to endure both salt spray and strong winds.

The taste for white Lilacs was introduced into Berlin, says a recent writer in *Gartenflora*, by the late Empress Augusta. To meet the demand which her preference excited, large quantities were imported from Paris just before the Franco-Prussian war, while, as the writer remarks with amusement, when they had been grown near Berlin by his father some years before, they had found no purchasers, as they were then not "the fashion." Now white Lilacs are produced in quantities in Berlin during the winter, but the demand can still not be met without the aid of daily consignments from Paris.

Mr. J. J. Thomas calls timely attention to the fact that many choice apples are lost because they are picked either too early or too late. To secure the best fruit of many varieties the trees should be gone over twice, once when the apples begin to drop, at which time the most mature can be picked out by their color and will readily loosen from the stem. Perhaps half of the apples will strongly adhere, and if the last gathering is then deferred for a fortnight those will keep longer and be better in quality. The old rule, to pick pears when the fruit will separate readily from the stem if lifted half-way up, is a good one, but pears usually ripen more nearly at the same time than apples. Early and medium late pears should be gathered some time before they are ripe, and the choice kinds should be laid away in dark boxes and they will have a much finer flavor than if ripened in the open air. Early pears wrapped in flannel and kept several days will not only improve in flavor, but those which have a slight blush naturally will redden into real beauty when matured in this way. Such care is not necessary with late autumn and winter pears, but, of course, they should be kept in a cool and uniform temperature.

Mr. T. S. Brandegee's interesting paper, in the fourth volume of *Zoe*, upon the southern extension of the California flora, has been issued in pamphlet form. On Mount San Pedro Mártir, situated about one hundred and twenty-five miles south-east of San Diego, and nearer the Gulf of California than the Pacific Ocean, which Mr. Brandegee describes as an extensive plateau rather than a mountain, with an elevation of 7,000 or 8,000 feet, traversed by numerous rocky ridges which rise 2,000 or 3,000 feet higher, he has found what is undoubtedly the southern limit of distribution of a number of well-known California trees. Trees of good size are found over nearly the whole of this elevated plateau, Pinus Jeffreyi being the most common. On the ridges the great California Sugar Pine, Pinus Lambertiana, grows sparingly, and along all the streams the Californian Libocedrus occurs. The other trees which will probably be found here in their most southern home are Populus tremuloides, Quercus agrifolia, Q. Wislizeni, the last two exclusively Pacific coast species. Q. chrysolepis and Q. grisea, which are both common in northern Sonora, where they possibly extend further south than in Lower California, also grow on this mountain. In the same region Mr. Brandegee found Juniperus Californica, Cupressus Guadalupensis, Abies concolor, here probably at its most southern station, and Pinus Parryana, the common Nut Pine of the northern part of Lower California.

Among the apples now coming to market here in quantity the Duchess of Oldenburg brings the best price, selling at wholesale for two dollars and seventy-five cents a barrel. A few Seckel pears are in market, but Bartlett pears from New Jersey, of excellent quality, have been bringing four dollars a barrel, nearly twice as much as is asked for Seckel pears. The best native black grapes now offered are Wordens, from the Hudson River, which are altogether superior to the Concords. Niagaras are in abundant supply, and of better quality than any yet seen this season, the earlier ones having been picked before they were ripe. Peaches have been plentiful and cheap, although the best fruit from New Jersey is worth from a dollar and twenty-five cents to two dollars a basket; these are mostly Mountain Rose and Crawfords. California plums sell more readily than eastern fruit, and prices have improved during the past week; the best bring forty cents a dozen. Cranberries from Cape Cod are in moderate supply, but as yet are light in color. The little Lady's-finger bananas, which are too rarely seen, are now coming in considerable quantity from Aspinwall, and sell for twenty-five cents a dozen. A so-called melon pear, from the West Indies, is found on some fruit-stands, and seems to sell quite readily on account of its rich golden color. It is a small melon, quite inferior in flavor to our best varieties. The beautiful Japanese persimmons are seen everywhere, and are evidently growing in popularity as they become better known.